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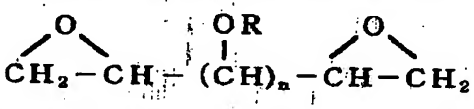
WHAT IS CLAIMED IS:

1. A hyperbranched polymer comprising at least one anhydrosugar-related compound selected from a dianhydrosugar alcohol represented by the following general formula [1]:



(1)

(wherein R is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms, provided that nR's are equal to or different from one another and at least one R of nR's is hydrogen atom, and

symbol n is an integer from 1 to 10)

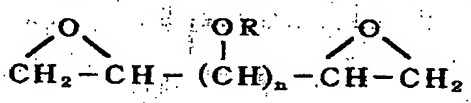
and an anhydrosugar alcohol represented by the following general formula [2]:

(2)

(wherein R_1 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_2 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_3 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and R_4 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; provided that R_1, mR_2's, pR_3's and R_4 are equal to or different from one another and at least one R_2 or R_3 of said mR_2's and pR_3's is hydrogen atom, respectively; and

symbol m is zero (0) or an integer from 1 to 20 and symbol p is an integer from 1 to 20, provided that symbol m+p is an integer from 1 to 20).

2. A hyperbranched polymer comprising at least one anhydrosugar-related compound selected from a dianhydrosugar alcohol represented by the following general formula [1]:

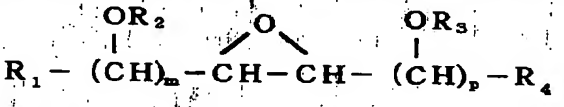


(1)

(wherein R is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms, provided that nR's are equal to or different from one another and at least one R of nR's is hydrogen atom, and

symbol n is an integer from 1 to 10)

and an anhydrosugar alcohol represented by the following general formula [2]:

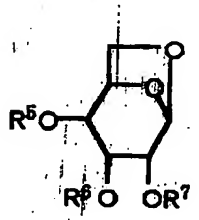


(2)

(wherein R_1 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_2 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_3 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and R_4 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; provided that R_1, mR_2's, pR_3's and R_4 are equal to or different from one another and at least one R_2 or R_3 of said mR_2's and pR_3's is hydrogen atom, respectively; and

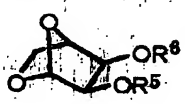
symbol m is zero (0) or an integer from 1 to 20 and symbol p is an integer from integer from 1 to 20, provided that symbol m+p is an integer from 1 to 20)

with at least one sugar compound selected from an anhydrosugar as represented by the following general formula [3]:



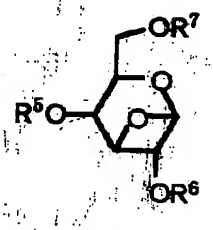
(3)

by the following general formula [4]:



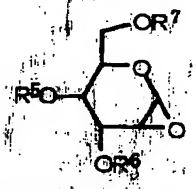
(4)

by the following general formula [5]:



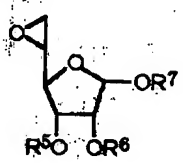
(5)

by the following general formula [6]:



(6)

and by the following general formula [7]:



(7)

(wherein R^5 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R^6 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and R^7 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; provided that R^5, R^6 and R^7 are equal to or different from one another).

3. The hyperbranched polymer as claimed in claim 1 or 2, wherein said hydrocarbon group is an alkyl group having from 1 to 30 carbon atoms, an aryl group having from 6 to 30 carbon atoms or an arylalkyl group having from 7 to 30 carbon atoms.

4. The hyperbranched polymer as claimed in claim 1 or 2, wherein said hydrocarbon group is an alkyl group having from 1 to 4 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an arylalkyl group having from 7 to 10 carbon atoms.

5. The hyperbranched polymer as claimed in claim 1 or 2, wherein said dianhydrosugar alcohol [1] is a 1,2:5,6-dianhydro-D-mannitol-type compound, a 1,2:5,6-dianhydro-L-iditol-type compound, a 1,2:5,6-dianhydro-annitol-type compound, a 1,2:5,6-dianhydro-galactitol-type

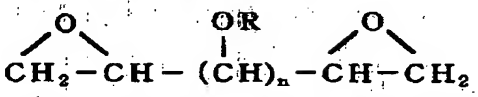
compound, a 1,2:5,6-dianhydro-glucitol-type compound or a 1,2:5,6-dianhydro-xylitol-type compound.

6. The hyperbranched polymer as claimed in claim 1 or 2, wherein said anhydrosugar alcohol [2] is a 1,2-anhydro-D-mannitol-type compound, a 1,2-anhydro-L-iditol-type compound, a 1,2-anhydro-annitol-type compound, a 1,2-anhydro-galactitol-type compound, a 1,2-anhydro-glucitol-type compound, a 1,2-anhydro-xylitol-type compound or a 1,2-anhydro-threitol-type compound.

7. The hyperbranched polymer as claimed in claim 1 or 2, wherein a degree of branching is from 0.05 to 1.00.

8. The hyperbranched polymer as claimed in claim 1 or 2, wherein a degree of branching is from 0.45 to 1.00.

9. A process for the preparation of a hyperbranched polymer comprising polymerizing at least one anhydrosugar-related compound selected from a dianhydrosugar alcohol represented by the following general formula [1]:

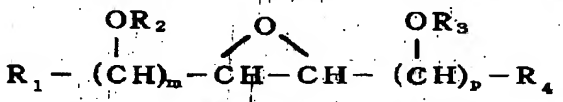


(1)

(wherein R is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms, provided that nR's are equal to or different from one another and at least one R of nR's is hydrogen atom, and

symbol n is an integer from 1 to 10)

and an anhydrosugar alcohol represented by the following general formula [2]:



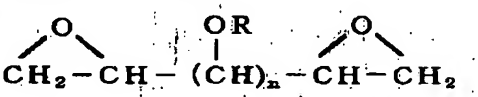
(2)

(wherein R_1 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_2 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_3 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and R_4 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; provided that R_1, mR_2's, pR_3's and R_4 are equal to or different from one another and at least one R_2 or R_3 of said mR_2's and pR_3's is hydrogen atom, respectively; and

symbol m is zero (0) or an integer from 1 to 20 and symbol p is an integer from 1 to 20, provided that symbol m+p is an integer from 1 to 20)

in the presence of a cationic initiator or an anionic initiator.

10. A process for the preparation of a hyperbranched polymer, comprising polymerizing at least one anhydrosugar-related compound selected from a dianhydrosugar alcohol represented by the following general formula [1]:

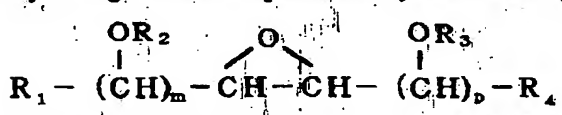


(1)

(wherein R is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms, provided that nR's are equal to or different from one another and at least one R of nR's is hydrogen atom, and

symbol n is an integer from 1 to 10)

and an anhydrosugar alcohol represented by the following general formula [2]:

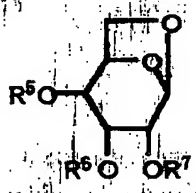


(2)

(wherein R_1 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_2 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; R_3 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and R_4 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; provided that R_1, mR_2's, pR_3's and R_4 are equal to or different from one another and at least one R_2 or R_3 of said mR_2's and pR_3's is hydrogen atom, respectively; and

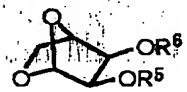
symbol m is zero (0) or an integer from 1 to 20 and symbol p is an integer from 1 to 20, provided that symbol m+p is an integer from 1 to 20)

with at least one sugar compound selected from an anhydrosugars as represented by the following general formula [3]:



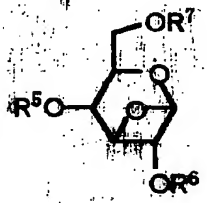
(3)

by the following general formula [4]:



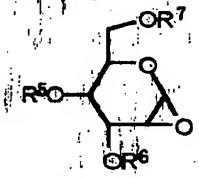
(4)

by the following general formula [5]:



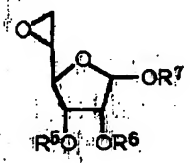
(5)

by the following general formula [6]:



(6)

and by the following general formula [7]:



(7)

(wherein R^5 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms;

R^6 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms; and
R^7 is hydrogen atom or a hydrocarbon group having from 1 to 30 carbon atoms;
however, provided that R^5, R^6 and R^7 are equal to or different from one another)
in the presence of a cationic initiator or an anionic initiator.

11. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said hydrocarbon group is an alkyl group having from 1 to 4 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an arylalkyl group having from 7 to 10 carbon atoms.

12. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said dianhydrosugar alcohol [1] is a 1,2:5,6-dianhydro-D-mannitol-type compound, a 1,2:5,6-dianhydro-L-iditol-type compound, a 1,2:5,6-dianhydro-alitol-type compound, a 1,2:5,6-dianhydro-galactitol-type compound, a 1,2:5,6-dianhydro-glucitol-type compound or a 1,2:5,6-dianhydro-xylitol-type compound.

13. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said anhydrosugar alcohol [2] is a 1,2-anhydro-D-mannitol-type compound, a 1,2-anhydro-L-iditol-type compound, a 1,2-anhydro-annitol-type compound, a 1,2-anhydro-galactitol-type compound, a 1,2-anhydro-glucitol-type compound, a 1,2-anhydro-xylitol-type compound or a 1,2-anhydro-threitol-type compound.

14. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said cationic initiator is a thermal cationic initiator, a photo cationic initiator, a Lewis acid or a Brenstead's acid.

15. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said cationic initiator is sulphonium antimonate, boron trifluoride diethyl etherate, tin tetrachloride, antimony pentachloride, phosphorus pentachloride or trifluoromethane sulfonic acid.

16. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said anionic initiator is a hydroxide or a metal alcolate.

17. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said anionic initiator is KOH, tert-BuOK or $Zn(OCH_3)_2$.

18. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein said cationic initiator or said anionic initiator is used at the rate of 1 to 10% by weight of starting anhydrosugar-related compound.

19. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein a degree of branching is from 0.05 to 1.00.

20. The method for the preparation of the hyperbranched polymer as claimed in claim 9 or 10, wherein a degree of branching is from 0.45 to 1.00.